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Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech (Full Time) - END SEMESTER EXAMINATIONS, APRIL/MAY 2024

Open Elective (B.E Mechanical both English and Tamil medium, Industrial, IT)

Semester VI

MF5691 MANUFACTURING OF AUTOMOTIVE SYSTEMS

(Regulations 2019)

Time: 3 hrs Max.Marks: 100

CO1	Identify different automotive system and its functions
CO2	Select suitable materials and production process for automotive components
CO3	Acquire complete knowledge on the production processes of automotive engine system
CO4	Understand the production process of automotive auxiliary systems
CO5	Develop knowledge in the advancements in automotive production

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A (10 x2 =20 Marks)

(Answer all Questions)

Q.No	Questions	Marks	CO	BL
1.	Define air-fuel ratio and compression ratio.	**2**	1	L1
2.	How energy absorbing steering column helps in a vehicle?	**2**	1	L3
3.	Mention the composition and applications of gun metal.	**2**	2	L2
4.	State true or false. Is Nitinol a smart material? Justify your answer.	**2**	2	L3
5.	How exhaust manifolds in an automotive systems are produced?	**2**	3	L3
6.	Why bearing lubrication is important? List any four types of lubrication systems.	**2**	3	L3
7.	What is an overdrive? Why synchronizer is required for transmission system?	**2**	4	L3
8.	What are the functions of brake shoe? List any two brake shoe materials.	**2**	4	L2
9.	What is meant by intelligent vehicle systems?	**2**	5	L2
10.	State true or false. "Sodium ion batteries are replacement for Lithium ion batteries as traction batteries in an electric vehicle". Justify your answer.	**2**	5	L4

PART- B (5 x 13 = 65 Marks)

Q.No	Questions	Marks	CO	BL
11 (a)	Classify and explain the engine and transmission systems.	**13**	1	L2
	OR			
11 (b)	With neat schematic explain the working principle and components of electrical and cooling systems.	**13**	1	L2

12 (a)	Enumerate the properties and applications of any four ferrous and non-ferrous materials.	**13**	2	L3
	OR			
12 (b)	Compile the different applications of polymers, composites and ceramics in an automotive system.	**13**	2	L3
13 (a) i)	Enumerate the manufacturing process involved in cylinder block	**7**	3	L3
ii)	Analyze the design considerations and relate the steps in production process of connecting rod.	**6**	3	L3
	OR			
13 (b) i)	Identify, analyze and outline process steps in different methods of production to manufacture inlet and exhaust valves.	**8**	3	L3
ii)	Compare multipoint fuel injection (MPFI) and common rail diesel injection (CRDI) systems.	**5**	3	L3
14 (a) (i)	Describe the functions, types of joints and production process of propeller shaft.	**7**	4	L4
(ii)	Compile the manufacturing operations involved in gear box.	**6**	4	L4
	OR			
14 (b)	Discuss the steps involved in production of wheel and tyre assembly with suitable sketches.	**13**	4	L4
15 (a)	Enumerate on any two types of hybrid vehicles using suitable sketch. Mention their advantages and limitations. Make a comparison between electric and hybrid vehicles.	**13**	5	L3
	OR			
15 (b) (i)	Enumerate the construction and working of a fuel-cell. Mention their advantages and applications.	**7**	5	L3
(ii)	With neat schematic explain the application and working of appropriate sensors and actuators in air bag deployment system and electronic stability control.	**6**	5	L3

PART- C(1 x 15 = 15 Marks)
(Q.No.16 is compulsory)

Q.No	Questions	Marks	CO	BL
16. (i)	Analyze the different methods for manufacturing piston and compile the types, functions and production process of piston rings.	**9**	3	L5
(ii)	Identify the manufacturing process of ceramic monolith and metallic monolithic honey comb substrate in catalytic converter.	**6**	4	L5